

AFRICAN REGIONAL TRAINING PROGRAMME ON LIGHTNING PROTECTION

Kampala, Uganda

4-8 FEBRUARY 2013

BRIEF REPORT

Lightning is a gigantic electrostatic discharge produced by unbalanced electric charges in the atmosphere either inside clouds, or cloud to cloud, or cloud to ground and accompanied by loud thunder sound. Lightning strikes cause tremendous losses each year through fires and vulnerability of transmission towers, communication towers, transmission lines and other tall physical structures and pose great threat to lives and property. Though most countries experience lightning strikes, some of those in the African continent have recorded the highest lightning densities in the world and consequent human injury.

For the capacity building in various aspects of Lightning Protection in the countries of the African region, the Centre for Science and Technology of the Non-aligned and Other Developing Countries (NAM S&T Centre) organised an **'African Regional Training Programme on Lightning Protection'** at Speke Resort Hotel, Munyonyo, Kampala, Uganda during 4th-8th February 2013 jointly with the State House, Uganda National Council of Science and Technology (UNCST) of the Ministry of Science and Technology, Ministry of Water and Environment, Department of Meteorology and Civil Aviation Authority of the Government of the Republic of Uganda. The Programme was hosted by Uganda Broadcasting Corporation (UBC), Kampala.

The International Training Programme was intended to benefit senior managers of government departments and ministries, managers of NGOs, scientists and scientific managers in private sector organisations with relevant background and active involvement in the subjects related to Lightning Protection. It covered extensive discussions on basic characteristics of lightning; lightning safety methods; protection of equipments and structures; low cost protection schemes; Kerauna medicine and first aid; counselling of victims and relatives of the dead; and development of national policies on lightning safety of public.

The International Training Programme at Kampala was attended by 69 participants (19 foreign and 50 Ugandan) from 17 countries, including Bangladesh, Belgium, the Gambia, India, Iraq, Kenya, Malaysia, Pakistan, South Africa, Tanzania, Togo, Turkey, United Arab Emirates (UAE), United States of America (USA), Zambia, Zimbabwe and the host country Uganda. The overseas participants were from Bangladesh [Dr. Munir Ahmed, Executive Director, TARA-Technological Assistance for Rural Advancement, Dhaka]; Belgium [Prof. Dr Ir C. Bouquegneau, Former Rector of the FPMs, Polytechnic Faculty, University of Mons, Mons]; The Gambia [Mr. Baboucarr Awe, Electrical Engineer, National Water and Electricity Company, Kanifing, Banjul]; India [Dr. Udaya Kumar, Associate Professor, High Voltage Laboratory, Department of Electrical Engg., Indian Institute of Science, Bangalore]; Iraq [Mr. Saleem Khudhair Hussein, International Relations Division, Ministry of Science & Technology, Baghdad];

Kenya [Mr. Situma Stephens Mukhebi, Science Secretary, National Council for Science and Technology, Nairobi]; Malaysia [Prof. Chandima Gomes, Associate Professor and Head, Centre for Electromagnetic and Lightning Protection Research (CELP), University Putra Malaysia (UPM)]; Pakistan [Mr. Hakimuddin Daud, Peshawar]; South Africa [Dr. Estelle Trengove, Lecturer, School of Electrical and Information Engineering, University of the Witwatersrand, Johannesburg]; Tanzania [Eng. A.H. Mmingwa, System and Control Engineer, Tanzania Electric Supply Company, Ilala Region]; Togo [Mr. Afanou N'Boueke, Engineer in Charge of Studies, Ministry of Mines and Energy Togo]; Turkey [Dr. Hasbi Ismailoğlu, Assistant Professor, Engineering Faculty, Electrical Engineering Department, Kocaeli University, Izmit Kocaeli]; UAE [Mr. Mohammed Khambalia, Dubai]; USA [Dr. Mary Ann Cooper, Professor Emerita, University of Illinois, Chicago and Prof. Vladimir A. Rakov, University of Florida]; Zambia [Mrs. Foster Chileshe Lubasi, Head, Materials Engineering and Technical Services, National Institute for Scientific and Industrial Research (NISIR), Lusaka]; and Zimbabwe [Ms. Beaula Chipoyera, Principal Science and Technology Officer, Ministry of Science and Technology Development, Harare and Mr. Jephias Mugumbate, Department of Meteorological Services, Belvedere, Harare]. The Centre for Science and Technology of the Non-Aligned and Other Developing Countries (NAM S&T Centre) was represented by its Director and Executive Head, Prof. Arun P. Kulshreshtha.

The brief Inaugural Session of the programme was addressed by Mr. Michael S.Z. Nkalubo, Commissioner Meteorology and Permanent Representative of Uganda with WMO in the Department of Meteorology, Ministry of Water and Environment of Uganda; Mr. Richard Tushemereirwe, Chairman, Training Course Organising Committee and Presidential Secretary In-charge of Science and Technology in the State House of Uganda; Dr. Ismail N. Barugahara, Assistant Executive Secretary, Uganda National Council of Science and Technology (UNCST); and Prof. Chandima Gomes from Malaysia.

The Training Programme was covered in seven technical sessions with one resource person for each of the sessions. The topics covered by the resource persons were: 'Fundamentals of Lightning' by Prof. Rakov (USA); 'Lightning Injury Mechanisms' and 'Lightning Medicine' by Prof. Cooper (USA); 'LP of Structures and Equipment' by Prof. Chandima Gomes (Malaysia); 'The Lightning Protection IEC 62305 International Standard' by Prof. Eng. Bouquegneau (Belgium); 'Lightning Protection of Power Systems' by Dr. Udaya Kumar (India); 'Societal Perspectives of Lightning Safety' by Dr. Trengove (South Africa); and 'Brief Status of Lightning Incidents in Bangladesh and Lightning Safety Education and Awareness in Bangladesh and South East Asia' by Dr. Munir Ahmed (Bangladesh).

Besides the training lectures by the resource persons, in each session, scientific papers and country status papers were presented by various participants, which included: 'Lightning Protection of Transmission Lines and Distribution Transformers' by Mr. Baboucarr Awe (the Gambia); 'Lightning Arrester' by Mr. Saleem Khudhair Hussein (Iraq); 'Lightning and Lightning Protection: General Comments and Overview about Lightning' by Eng. A. H. Mmingwa (Tanzania); 'Earthing Systems' by Mr. Afanou N'Boueke (Togo); 'Protection against Lightning

Standards - Applications and Some Measures' by Dr. Hasbi Ismailoğlu (Turkey); 'Lightning Protection in Zambia' by Mrs. Foster Chileshe Lubasi (Zambia); 'Lightning in Zimbabwe: Statistics, Costs and Protection' by Ms. Beaula Chipoyera (Zimbabwe); 'Lightening and Traditional Beliefs in Uganda' by Dr. Masinde Moses (Principal Lecturer, National Meteorological Training School, Uganda); 'Lightning Incidences in Zimbabwe' by Mr. Jephias Mugumbate (Zimbabwe); 'Lightning Accidents in Uganda' by Ms. Ahurra Kulyaka Mary (Forecaster, National Meteorological Centre); 'Kasese and Kisoro Non Directional Beacon (NDB-436) Lightning Protection' by Mr. David Macho (Safety Management Systems & Quality Assurance, Civil Aviation Authority (CAA) of Uganda); 'Lightning Protection in Kenya' by Mr. Situma Stephens Mukhebi (Kenya); and 'Solar Winds' by Mr. Benon Fred Twinamasiko (Physics Department, Makerere University, Kampala, Uganda). The Director, NAM S&T Centre, Prof. Arun Kulshreshtha also made a brief presentation on 'The Role of the NAM S&T Centre for the Promotion of South-South Cooperation in Science and Technology'.

The participants were ferried to Imperial Resort Beach Hotel at Entebbe on Lake Victoria, which is Africa's largest lake by area (68,800 sq. km), and is the largest tropical lake in the world, for a formal Banquet Dinner and Exhibition hosted by Mr. Jeremy Usher, Vice President of Earth Networks which is an environmental sensor networking company dedicated to understanding the planet and its atmosphere and operates the largest real-time, neighbourhood-level weather monitoring and lightning detection network delivering severe weather alerts when minutes matter. Mr. Usher also made a presentation followed by a question-answer session.

The participants made a brief but yet highly productive visit to the Uganda Broadcasting Corporation (UBC) and met with its Managing Director, Mr. Paul KIHKA, at a discussion session.

The Concluding Session was presided over by Prof. Waswa Balunywa, Principal, Makerere University Business School at Kampala. Based on valuable feedback and critical comments of the delegates, a 'Resolution to establish an African Center for Lightning Information and Research (ACLIR)' was unanimously adopted, a copy of which is **appended**. 'Certificates of Participation' were handed over to the participants of the Training Course by the Chief Guest, Prof. Balunywa, Commissioner Meteorology, Mr. Nkalubo; and Director, NAM S&T Centre, Prof. Kulshreshtha. The event concluded with the participants thanking and greatly applauding the efforts made by the NAM S&T Centre and UBC, Kampala and Meteorology Department in organising such a wonderful and useful Training Course. The involvement of Dr. Richard Tushemereirwe in making this programme a success was also greatly appreciated by the participants.

On the last day of the programme, the delegates visited Jinja, the source of the River Nile, located about 90 km from Kampala in South-Eastern Uganda.